Growing WILD

Spring/Summer 2002 ***Utah's Project WILD Newsletter***

Utah's Dandy Diving Birds: Loons and Grebes

It was a cool, misty April morning in the Uinta Basin. All was quiet except for the crisp sound of my footsteps on the frost-covered ground. As I walked out towards a small reservoir not too far away, something floating on the surface of the still water caught my eye. At first I wasn't sure I was seeing what I thought I was seeing. Having an unmistakable silhouette, a closer look confirmed what I had suspected. It was a beautiful, black and white-patterned common loon, a bird I've greatly admired, but never before seen in the wild. A second one, maybe its mate, floated low in the water a short distance away. Primarily birds which breed far to the north, loons are a rare site in Utah. These two were most likely just passing through.

Another rare site to see was a completely white-feathered bird bobbing up and down on the waves of the Great Salt Lake along the north side of the causeway leading to Antelope Island State Park. I wasn't a gull or tern, but an albino eared grebe. A bird that isn't rare as a species, being commonly seen on the lake in summer and fall, but rare indeed as an individual eared grebe.

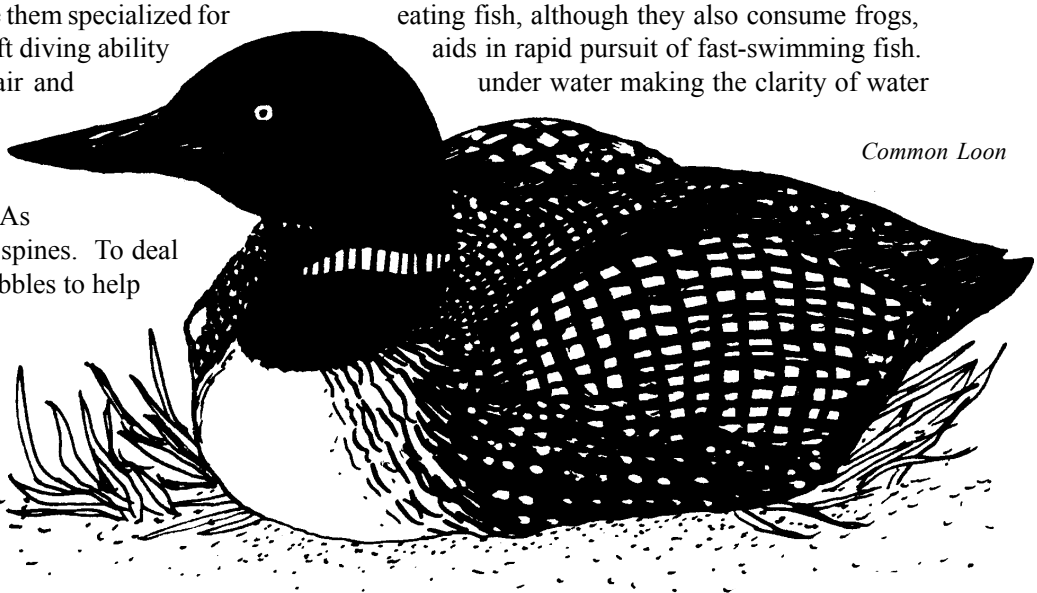
Among the most well adapted for diving and swimming of all aquatic birds, loons and grebes are classified within two similar but unrelated orders of birds, the Gaviiformes and the Podicipediformes, often referred to together as the Diving Birds. Once considered closely related, scientists now agree the features and behaviors shared by members of these two orders exemplify cases of convergent evolution.

Loon-like birds have been around for a long time as shown by fossil evidence dating back 40 to 50 million years ago. The five species of loons, the red-throated, yellow-billed, Arctic, Pacific and common loons, living today lie within the order's one family, the Gaviidae. Gaviidae, from Latin, means sea smew (a smew is a small, crested Old World duck). The name "loon" is thought to have come from an old Scandinavian word *lom*, meaning a lame or clumsy person, in reference to the loon's clumsiness on land.

Loons are notably clumsy on land because their legs are positioned extremely far back on the body instead of underneath as in a duck. This makes walking extraordinarily difficult for loons and so on land, they appear quite awkward, scarcely able to shuffle along, sometimes sliding on their bellies and arduously using their wings to help them move. On water though, they are powerful swimmers, able to dive to great depths and maneuver exceptionally well, propelling themselves solely with their webbed feet. Interestingly, their strong leg muscles, unlike those of any other birds, are part of their streamlined body mass. The flattened tarsi of loons also reduce drag.

Unlike in other birds, most of the bones of loons are solid, rather than filled with air spaces (pneumatisized), making them heavier for diving. Loons can also regulate their buoyancy by adjusting their feathers to press out air and expelling air from their lungs and air sacs. This allows loons to sink slowly and quietly below the surface leaving scarcely a ripple.

The dagger-like pointed bills of loons make them specialized for eating fish, although they also consume frogs, crustaceans and aquatic insects. Their swift diving ability aids in rapid pursuit of fast-swimming fish. Loons have eyes that can focus both in air and under water making the clarity of water important in locating prey. The red eyes they possess also apparently filter out the reds, oranges and yellow colors in the water enhancing their underwater vision. As fish eaters, loons ingest scales, bones and spines. To deal with these internal hazards, loons injest pebbles to help grind up these tough items.



Common Loon

Restricted to the Northern Hemisphere, all loons are migratory, breeding on clear, deep lakes of the far northern latitudes and wintering in coastal harbors and

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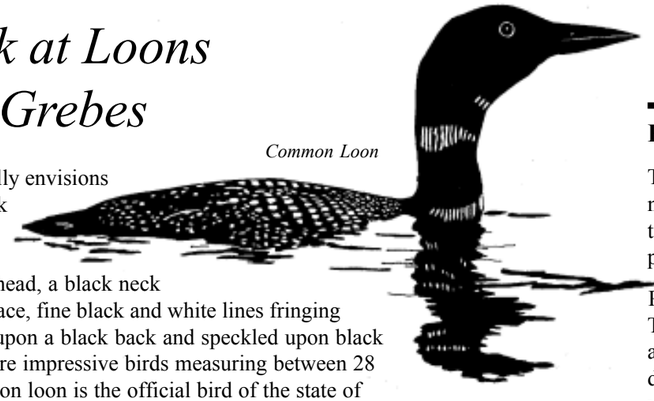
A Look at Loons and Grebes



Common Loon

Common Loon - *Gavia immer*

When one conjures up an image of a "loon" in their mind, one usually envisions the familiar common loon dressed in the uncommonly striking black and white plumage it wears while on its northern breeding lakes. Designed with only two colors, the truly elegant pattern of the plumage of the common loon consists of a glossy black-feathered head, a black neck partially encircled by a thin white chin strap and a bold white necklace, fine black and white lines fringing a sharp white breast, and small to large rectangular spots checked upon a black back and speckled upon black wings. Deep red eyes complete the loon's attire. Common loons are impressive birds measuring between 28 and 36 inches in length and weighing about 10 pounds. The common loon is the official bird of the state of Minnesota and Ontario, Canada. Quite popular, it is affectionately referred to by many as the Great Northern Diver.

Reverence for the common loon extends beyond its beautiful appearance to its mysterious and magical voice. In the language of loons, there are four basic calls: the hoot, the wail, the tremolo and the yodel.

-The hoot is the simplest of the loon calls, consisting of one, short note that sounds more like a "hoo." Frequently heard, the hoot is a quiet, intimate call used mainly by family members to keep tabs on each other and check up on their well-being. It's sort of like loons saying "hey, what's up?"

-The wail is a long-drawn call with a mournful quality similar to the howl of a wolf, or the notes of a clarinet. Described by Oliver Austin as "one of the loveliest sounds in nature," the wail, a contact call, is used to beckon a mate to return if far away or out of sight, or to call a chick, for example, to come closer. Wail calls can be one, two or three notes in length and varied in volume depending on the urgency of the message –-a soft , one-note call being the least urgent.

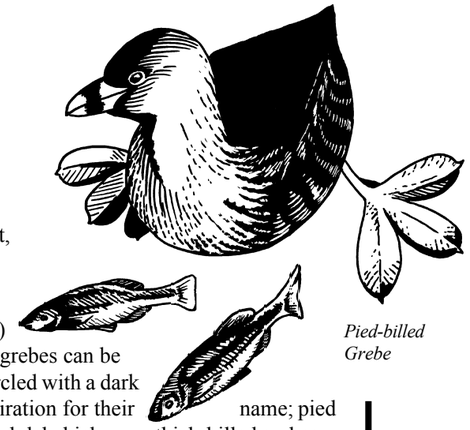
-The tremolo call is used to signal alarm, denote annoyance, express distress. The tremolo is a trembling staccato set of high and low notes that sound like a crazed laugh. In the words of John McPhee, if the loon were human, its eerie tremolo call "would be the laugh of the deeply insane." The call is usually coupled with actions such as a run on the surface of the water, a dive or a takeoff. A tremolo is often elicited by people approaching too closely. Loons also give the tremolo as an overhead flight call.

-Naturalist Sigurd T. Olsen describes the yodel as "the weirdest and wildest of all calls." The yodel serves as an aggressive territorial proclamation, given exclusively by males. It is performed with the male loon's head crouched low over the water. The yodel sounds like a series of high and low notes given in a series of repeated phrases. It is usually accompanied by the loon's "penguin dance" where the loon stands erect on the water with his wings open, belly pointed forward and his head tucked down. Each male loon has his own unique yodel call.

"Loon Music" is mainly made by loons during the breeding season. In spring, loons return to their breeding lakes as soon as they become free of ice. Loons are generally long-lived (up to 30 years for the oldest) and pairs from earlier years usually return to their same breeding territory. Soon after arrival pairs renew their partnership with a gentle courtship "circle dance" which involves close swimming, bill dipping, head shaking and mewing calls.

A nest site close to the water's edge, preferably on a protected island, is chosen to allow for easy access and exit. Loons construct their nests out of a variety of materials found near the nest site—typically dead vegetation and a little mud. Once the nest is made, two olive-brown, dark-splotched eggs are laid by the female about a day apart. Both parents share incubation duties. After 28 or so days, the first chick pecks its way out of the shell. The second chick follows suit soon after. As soon as their soot-colored down has dried, they take to the water where the spend most of the rest of their lives. Although the tiny loons can swim and dive soon after hatching they depend on their parents to feed and defend them. Often the young chicks get to ride on the backs of their parents to rest or warm up, or be kept safe from predators.

By the end of summer, the loons are ready to leave their breeding lakes and return to their winter abodes in the coastal waters of the continent, somewhere between the Aleutian Islands and Baja California on the Pacific Coast or New Brunswick and northern Mexico along the Atlantic and Gulf coasts. The young will stay on the wintering grounds for 3 years, after which they will dawn their classy breeding raiment and head north. Perhaps some fall or spring you'll get a chance to see some beautiful loons as they make their way across Utah.



Pied-billed Grebe

Pied-billed Grebe - *Podilymbus podiceps*

The most widespread of the American grebes, the pied-billed grebe nests from northern Canada south throughout the United States and the West Indies, to temperate Central and South America. In Utah, it is a common summer resident, preferring marshy wetlands, lakes and slow-flowing rivers.

Pied-billed grebes are small, stocky unostentatious brownish-colored grebes. The belly is pale, and during the breeding season, a black patch (white in winter) accents the chin and throat. Resembling a small duck without a tail, pied-billed grebes can be distinguished by their short chicken-like bill that is bluish-white in color and encircled with a dark vertical band (only banded in the breeding season). Their banded bill is the inspiration for their name; pied means "being of two different shades or colors." They are also sometimes called dabchicks or thick-billed grebes.

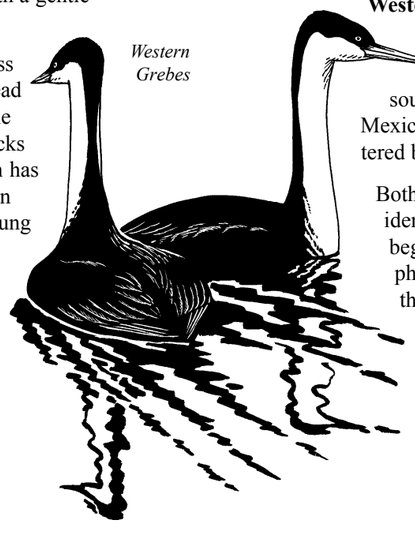
Relatively shy and secretive, pied-billed grebes often float very low in the water with just their eyes and nostrils above the water's surface, serving like the periscope of a submarine. When threatened, they may stealthily sink completely out of sight, or "crash dive," kicking water several feet into the air.

Pied-billed grebes are known to be one of the first species to arrive at their breeding areas each spring. They are solitary nesters, and usually a small pond will have only one nesting pair on it. Being highly territorial, on larger lakes they will aggressively defend their territories. Making underwater attacks, a territorial grebe will dive down and peck at the feet of the intruder being chased from below.

Upon arrival, males establish a territory. As females arrive, courtship behaviors involving subdued circling and billing behaviors ensue between pairs. Cuckoo-like songs comprised of variable *wup-wup* notes starting slowly and softly, and followed by repeated *caow-caow-caow* sounds can be heard across the pond, often before the grebes are seen.

After pairs have formed, the two grebes build a well-concealed nest within an area of tall vegetation near the edge of the pond and just slightly above the water level. The nest is usually a floating platform structure anchored to emergent vegetation, although in shallow water it may be anchored to the bottom. Piling up decaying vegetation and mud brought up from the bottom of the shallow pond they complete their nest within three to seven days.

An average of six, dull whitish-green eggs, which soon become stained brown, are laid and incubated by both parents. When leaving the nest, the parent grebe will hide the eggs by pulling water-soaked materials over the eggs. After about 23 days, the precocial downy chicks emerge. Striped variably in a black, rufous and white pattern, they soon follow after their parents, often hitching a ride atop their back. The parents will sometimes feed the chicks while they ride on their back and will even dive below the water's surface with the chicks aboard. Somehow they manage to stay attached, possibly hanging on to their parent's feathers with their bill. By one to two months of age, the chicks become independent of their parents. Being not only the first to arrive at their breeding areas, but also the last to leave, often the parents are able to start again and raise a second brood.



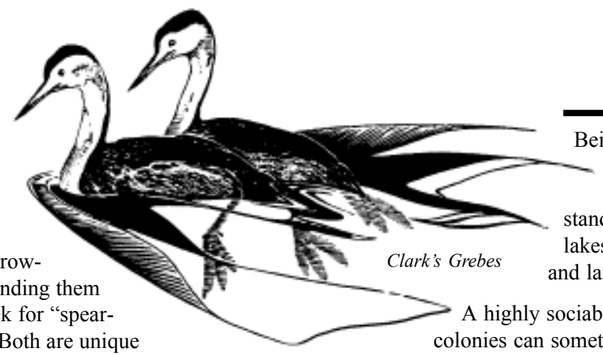
Western Grebes

Western Grebe - *Aechmophorus occidentalis* and **Clark's Grebe - *Aechmophorus clarkii***

The western and Clark's grebes are conspicuous water birds of western North America, probably best known for their elaborate and energetic courtship rituals. Both species breed on large inland lakes from southwestern and central Canada south through the Northwestern and north-central United States to central Mexico. In Utah, they commonly breed in the north-central portion of the state. They winter primarily in sheltered bays and estuaries along the Pacific Coast from southeastern Alaska to Baja California and western Mexico.

Both species of grebes were first described in 1858 at the same time and place. At that time, although practically identical in most respects, the two species were regarded as distinct species. Later, however, ornithologists began to think they were actually members of the same species, with the Clark's grebe merely being a color phase of the western grebe. This thinking is evidenced in the scientific literature pertaining to these birds from the period between 1886 and 1985 in which only the western grebe is written about.

Incredibly similar in appearance and behavior, over time, ornithologists began to rethink their classification scheme. It was noted repeatedly that even though the two versions nested side by side, rarely did they interbreed. Instead, they clearly mated assortatively —westerns preferring to mate with westerns and Clark's mating with Clark's. Various studies of behavior, morphology and genetics showed that the only



Clark's Grebes

differences, the number of notes in their *kweet* "advertising call"—two in the western versus one in the Clark's— and slight differences in bill color and facial patterns, were enough for individuals to recognize others of their own species and select them as mates. Since 1985, they have been once again considered separate species.

Both the western and Clark's grebes can be described as large, graceful, black and white, narrow-bodied grebes with sharply pointed bills, scarlet eyes and slender swan-like necks, a feature lending them to sometimes being called "swan grebes." The generic name of both, *Aechmophorus,* is Greek for "spear-bearer" and refers to their rapier-like bills which they use to spear fish, the bulk of their diet. Both are unique among grebes in possessing a mechanism in the neck that permits them to thrust their head forward like a spear.

Both species have sooty black feathers on their back, backside of the neck and crown which contrast elegantly with satiny white feathers on their belly, breast, fore neck and throat. What mainly distinguishes the two in appearance is the extent to which the black feathers of the crown reach down on the face and the coloration of the bill. In the western grebe, the black feathers of the crown drop below the bright red eyes; in the Clark's grebe, they pass above the eyes. The bill of the western grebe is yellowish-olive green in color and that of the Clark's grebe is bright yellow-ish-orange. In terms of distribution, the Clark's grebe is more common in the southern portions of the combined range of the two species and relatively rare in the northern part.

Western and Clark's grebes are colonial nesters with hundreds or even thousands nesting close to each other on some larger lakes. Both are noted for their complex courtship ceremonies in which they perform a series of ritualized displays. The most spectacular display, known as "rushing," or more eloquently the "water dance," is familiar to many people, having been featured in many nature films. Not solely a courtship display, rushing can involve combinations of birds other than a paired male and female, and when done between males is usually preceded by aggressive displays.

Rushing begins as two or sometimes more grebes swim toward each other, alternately either "ratchet-pointing," heads extended forward and bills pointing towards each other, or "dip-shaking," each bird rapidly dipping its bill into the water, then raising its head and shaking its bill from side to side. Just before touching bills, each bird makes a quick right-angle turn, then rises up and takes off along side the other, dashing in unison across the surface of the water.

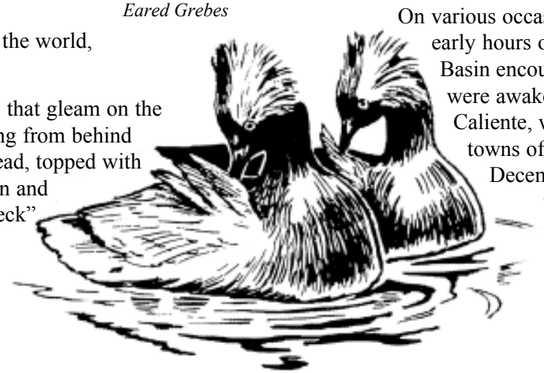
While racing across the water, they hold their bodies straight up, their wings back, their long necks arched upwards and their heads thrust forward. Their feet, pounding on the water, create a motor-like roar. After racing fifty to a hundred feet or so, both suddenly dive under the water and then resurface. Male to male rushing is followed by more ratchet-pointing and dip-shaking and by "barging," in which both move slowly forward in a vertical posture with the upper two-thirds of their body out of the water, turn their bills at regular intervals towards each other and utter a trilling whistle similar to the sound of a boiling tea kettle. A paired male and female end rushing by swimming off together after their dive below the water.

Later in their courtship, pairs may perform the "weed dance." In this beautiful display, both grebes first dive underwa-ter and pop back up with a beakful of watery weeds. Then, approaching each other, they meet face to face and rise higher and higher out of the water, finally meeting breast to breast. Here, nearly standing on the water for several seconds, they cross their beaks together, move forward or spiral and then gradually sink down and swim off together.

These displays and others, lead to nest building, mating, egg laying and ultimately, in less than a month, the arrival of three to four fluffy grey-colored chicks, which will ride upon their parent's backs, fledge into juveniles, develop into adults and once again perform wonderful grebe races and dances on the lakes of the West.

Eared Grebe - *Podiceps nigricollis*

Eared Grebes



The eared grebe is by far the most abundant member of the grebe family in North America and in the world, with four subspecies ranging over western North America, Central America, Eurasia, and Africa.

The small, slender-necked eared grebe is so named because of the tufts of burnished gold feathers that gleam on the sides of its head during the breeding season. Other than these golden, fan-shaped ear tufts radiating from behind its deep red eyes, the eared grebe is a relatively dark-colored grebe with a black back, neck and head, topped with a black crest. Its sides and flanks are cinnamon-brown and its underparts are white. Its bill is thin and slightly upturned in most individuals. The eared grebe's species name, *nigricollis,* means "black neck" in Latin, and in the British Isles, the eared grebe is known instead as the black-necked grebe.

Being the most abundant grebe in North America, the eared grebe is also the most common grebe in Utah, breeding regularly throughout the state. They prefer to nest in shallow, marshy lakes and ponds having reliable water levels of about one to three or four feet that support extensive stands of emergent vegetation like bulrush or cattail needed for nest construction and protection. Such lakes also support large communities of macroinvertebrates (small crustaceans, snails, aquatic insects and larvae) upon which these grebes feed.

A highly sociable species, eared grebes form large, dense breeding colonies made up of thousands of birds. These colonies can sometimes be so crowded that the nests even abut one another. Spring courtship rituals of the eared grebe include an assortment of displays similar to those observed in other grebes. Early on, unpaired grebes seeking mates will advertise their availability by swimming about with their neck and head held high, with the bill pointing straight forward. Feathers on the neck and those of the crest are raised and body feathers are fluffed out. While swimming, they utter a *poo-ee-chk* frog-like cheeping sound.

When paired, grebes often engage in "habitat preening," the most common display observed. During this display, the two grebes swim along side by side simultaneously preening identical feather areas on their body with robotic, quick and vigorous movements. Displays in which the male and female of a pair each perform identical movements and make the same vocalizations are called mutual displays. Such synchronized displays are common in species where both sexes look alike, as in grebes.

Despite its general similarity to other grebes, the eared grebe is quite distinctive in its behavior and physiology following the breeding season. Immediately after the breeding season, most of the population (90%) of eared grebes move to either of two highly saline environments in the western United States: Mono Lake in California or the Great Salt Lake in Utah. They stage (rest, molt and feed) at these two locations to exploit a superabundance of brine shrimp and alkali flies that thrive in the lakes. During this time, rafts of hundreds of thousands of eared grebes can be seen.

On the Great Salt Lake, eared grebes begin to appear along the causeway to Antelope Island in late August. While there, they undergo an amazing physiological transformation. Arriving at a trim 250 grams, they more that double their weight feasting almost exclusively on brine shrimp. To maximize their digestive capabilities the grebes make a trade-off, becoming flabby and flightless as their pectoral muscles needed for flight atrophy and their organs used for digestion increase greatly in size. These changes in size proportions in the eared grebe are the most extreme yet known for any bird.

Over a period of four months, each eared grebe eats about 15,000 bring shrimp per day. Because of their intimate tie to brine shrimp, Great Salt Lake biologists have begun to inquire about the relationship between brine shrimp, their harvest and the survival of eared grebes. Answers in such a complex ecosystem as that of the Great Salt Lake will be difficult to ascertain.

As the food source naturally starts to die off, the grebes reverse their physiological transformation, losing weight by decreasing the mass of their digestive organs, catabolizing much of their just-deposited fat, and increasing the size of their heart and flight muscles needed for their non-stop flight to the Gulf of California and Salton Sea where most spend the winter.

As they approach flight weight, the eared grebes gather in remote parts of the lake. There in groups numbering hundreds of thousands, they take off and head south in the darkness of night. Having extended their stay as long as possible, their southward migration, which takes place as late as January, is the latest of any North American migrant.

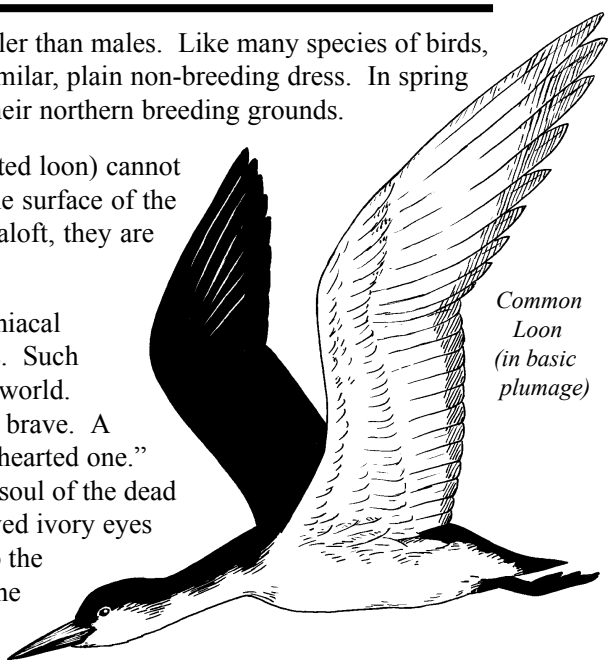
On various occasions, their seasonally late journey has gotten eared grebes into trouble with the weather. In the very early hours of December 13, 1928, a huge flock of eared grebes passing over the south central edge of the Great Basin encountered an extremely heavy snowfall. At 2:00 a.m. sleepy residents of the town of Caliente, Nevada were awakened by heavy thumpings on their roofs as it began to "snow" eared grebes. Although centered in Caliente, where thousands of grebes fell from the sky, several hundred also dropped down upon the Utah towns of Enterprise, Uvada and Modena located about 45 to 65 miles north of Caliente. On the evening of December 10, 1991 in Minersville, Utah a similar event occurred. Many grebes perished, but survivors were taken to bodies of water where they could rest and take off again to resume their journey.

A visit to the Great Salt Lake to see these amazing grebes would certainly be well worth the effort.

(continued from cover)

bays of temperate regions. Both sexes appear alike, but females are usually smaller than males. Like many species of birds, loons have two outfits in their wardrobe. During the winter all species sport a similar, plain non-breeding dress. In spring though, each species molts into a striking nuptial plumage before departing for their northern breeding grounds.

Migration takes place during the daylight hours. Loons (except for the red-throated loon) cannot fly from land. To become airborne, loons must run and flap their wings along the surface of the water, using a runway that sometimes approaches several hundred yards. Once aloft, they are swift, powerful flyers able to fly at speeds upwards of 60 miles per hour.



Common Loon (in basic plumage)

Loons are famous for their haunting soliloquies of mournful wails and weird, maniacal laughing calls they make while courting each other and defending their territories. Such eerie sounds inspired many legends and beliefs in native cultures of the northern world. Some cultures included the loon in creation stories and some considered the loon brave. A Chippewa name for the loon, *mahng*, for example, roughly translates into"brave-hearted one." In Siberia, Scandinavia and North America it was believed loons could guide the soul of the dead to a new world. Stone Age Innuits in Alaska even buried a loon's skull with carved ivory eyes within their graves. It is believed the unearthly calls of the loon also gave rise to the phrase "crazy as a loon." Today, the "song of the loon" has come to epitomize the wildness of the remote north.

Grebes are an ancient group of birds as well, having been inhabitants of lakes and marshes for nearly 80 million years. Grebes belong to the family Podicipedidae, a name aptly derived from the Latin words meaning "rump-footed," in reference to the legs and feet of grebes, which similar to loons, are set well back on the body. Not only do grebes have feet positioned at the extreme hind end of the body, they have exceptionally flexible ankles and toe joints which allow their feet to pivot in all directions for use as both paddles and rudders. Their toes are also lobed, a feature which helps in maneuverability as well.

Some 20,000 soft, dense feathers which comprise the plumage of grebes also keep them warm and dry in their watery world. This fact was expressed well by T. Gilbert Pearson in *Birds of America* where, in reference to their plumage, he wrote, "... it is absolutely waterproof, and therefore, grebes, though water birds, are never wet."

Although grebes do possess hollow bones like other birds, they are still able to sink low in the water by expelling air from between their feathers and emptying their air sacs. When alarmed, they can dive surprisingly quickly, disappearing right before one's eyes. This skill has earned them some colorful nicknames such as hell divers and water witches.

Grebes, like loons, are ungainly on land. Unable to initiate flight from land, they also require long takeoff runs across the water's surface to become airborne. Not adept flyers, grebes rarely fly, except while migrating. Flying at night during migration, they sometimes mistake wet roads for rivers, land on them and become stranded.

Grebes, like loons, are predominantly fish eaters (they eat insects and seeds of aquatic plants too) but deal with the dangers of fish eating in a unique way. Grebes ingest their own body feathers which apparently provide physical protection, and also delay the passage of larger bones and scales exposing them longer to the dissolving action of hydrochloric acid in the stomach. Parent grebes even feed feathers to their young.

Grebes are not as vocal as loons, but around marshes where they nest, one can hear a variety of wails, chuckles, croaks and trills. Courtship behaviors of grebes are quite elaborate and striking however, involving complex sequences of ritualized postures and dances.

Worldwide, there are 20 species of grebes of which six, the pied-billed, western, Clark's, horned, red-necked and eared grebes reside in North America. They find the desert lakes, ponds and marshes of the Great Basin more to their liking than do loons and all six species have been recorded in Utah.

Grebes have soft, thick lustrous plumage. Their smooth breast feathers, described as even being almost like fur, were once used in the millinery trade to decorate women's hats. In the early 1900s, excessive killing of grebes for the feather market in the Oregon area prompted campaigns and political battles fought by local Audubon societies, and in 1908, led Theodore Roosevelt to set aside Malheur and Klamath lakes as bird refuges.

Today protected from hunting by law, grebes and loons face other survival challenges. Many populations have suffered greatly from the degradation and destruction of the breeding habitats due to the actions of people. In addition, at the apex of the food web, grebes and loons are at great risk from environmental contaminants such as pesticides and heavy metals which tend to concentrate via biomagnification within the bodies of top predators, especially in aquatic ecosystems.

Resources

"Rush" for these Resources!

Call Project WILD at (801) 538-4719

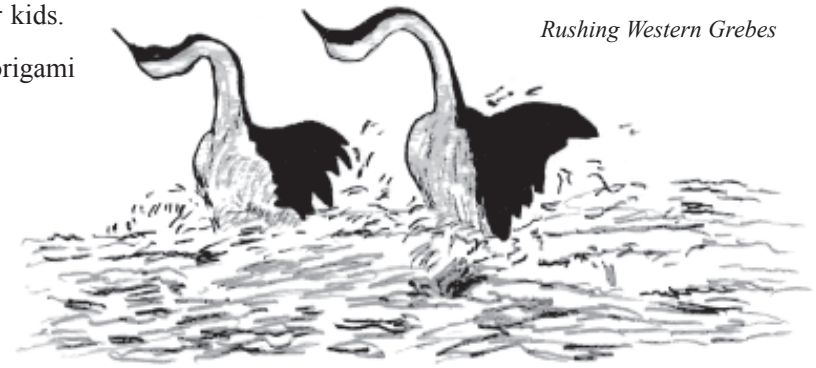
Free Loon and Grebe Resources:

Loon Posters - Three beautiful posters featuring the common loon with good educational information on the reverse side. Sent courtesy of the Minnesota Department of Natural Resources, Project WILD program. One, titled "Get the Lead Out" features loons and the problems of lead poisoning.

Loons and Life - Copy of the excellent activity guide featuring loons, produced by Peter Roberts Productions. Includes a loon video which compliments the activity guide, a loons question and answer booklet from the North American Loon Fund and other supplemental educational materials. **Available for check-out only.**

Loon Coloring Sheet - Cute coloring sheet for younger kids.

Western Grebe Origami - Instructions for folding an origami western grebe.



Rushing Western Grebes

Loon and Grebe Internet Sites:

Loon Calls - Three additional good websites to listen to loon calls and learn other loon information.
http://www.michiganloons.org/vocalizations.htm
http://www.math.sunysb.edu/~tony/birds/loons.html
http://www.learner.org/jnorth/tm/loon/identification.html

Birds of the World on Postage Stamps - A great site highlighting loons and grebes featured on stamps from around the world. From this site, click on the forward blue arrow on the bottom right to see 13 more loon and grebe species on stamps. **http://www.bird-stamps.org/species/8002.htm** This is a good site to accompany the Project WILD activity, "Wildlife as Seen on Coins and Stamps." (Many other species are featured as well.)

Critter Corner: Loons - Part of the excellent Environmental Education for Kids (EEK) website offered by Wisconsin Department of Natural Resources **http://www.dnr.state.wi.us/org/caer/ce/eek/critter/bird/loon.htm** Check out other great activities and resources that are part of this site.

North American Bird Project Lesson Plans - Set of bird lesson plans including some for loons and grebes. To be used in conjunction with images of birds and natural history information included at the site. **http://birdcentral.net/lessonplans.htm**

Other FreeMaterials :

Ecoregions of Utah - Great large format map/poster delineating the ecoregions of Utah. For each ecoregion, there is a photograph and detailed written information.

Creating Landscapes for Wildlife: a guide for backyards in Utah - Updated version of this excellent booklet written to guide you in selecting and arranging plants and other elements that fulfill wildlife needs to help you attract, observe and enjoy wildlife within your own yard.

Other New Materials Available For Check-out:

Tracks Stories Kit - a new set of rubber track replicas for a variety of Utah species assembled specifically for older students to create "track stories." Contains fore and hind paws for the four-legged animals in the kit, a tracks detective lead-in activity sheet and detailed information about gaits, habits etc. for species in the kit.

Ravens - Beautifully filmed video featuring the natural history of ravens and raven lore. From the PBS, *Nature* series. 55 min.

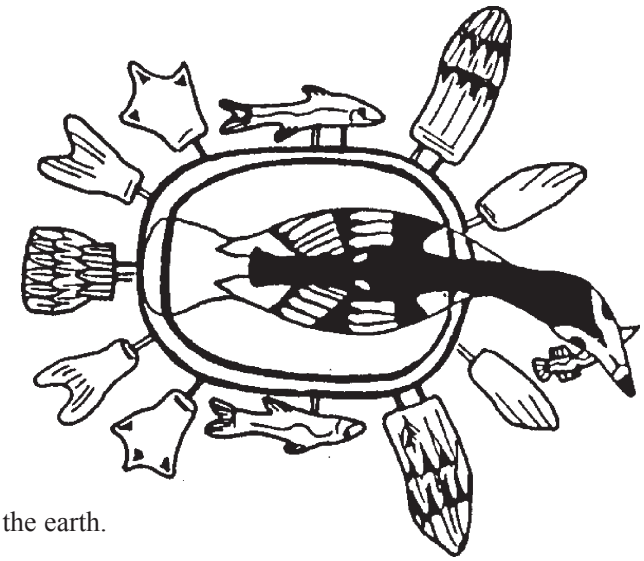
The Salt Lake Valley Watershed and You - Hosted by Bill Nye the Science Guy, this fun video details actions that were taken during the 2002 Salt Lake Winter Olympics to curb waste, reduce air pollution, and conserve water and enegy. Shares ideas how individuals can make a difference. Activity sheet included. 12 min.

LOONS AND LEGENDS

Language Arts, Drama, Social Studies

Objectives:

Students will be able to:
1. Explain why and how people create legends.
2. Give an example of the loon's role in legends.
3. Create a legend of their own about loons.



Background: Birds and other animals have been part of the daily activities of people from the beginning of time. Native Americans lived in close proximity to wildlife, and in many cases depended on birds, mammals and fish for food and clothing. They often shared legends about the animals in their lives. In legends, animal characters are used to explain how and why events occurred; for example, how the loon got its "necklace," or its voice, or the role the loon played in the creation of the earth.

A legend is a popular story handed down from earlier times, believed to have a historical basis, but not verifiable. These stories entertain, explain or teach. Most importantly, legends make the wild creature a familiar friend or a significant part of the lives of the people. Legends teach appreciation of the animal as an integral and necessary part of the life experience. They may make people feel closer, friendlier and more connected to the animals. When people share legends from the past, they may feel closer to those who lived in earlier times.

Loons especially lend themselves to legend because of their eerie, yet beautiful voice, their splendid black and white coloration and piercing red eyes, and their remarkable diving ability. Legends about loons were often based on beliefs that loons had magical powers. They were mysterious, rarely seen up close, so stories about them were hard to verify and more likely to be believed.

The Ojibway Tribe inhabited the shores of Lake Superior (in today's Canada and the U.S.). They had different families or clans and each took the name of an animal. One of the clans called itself the Loon Clan. Loons were seen as strong, courageous, good fishermen, good swimmers and divers, and beautiful, characteristics in which the Loon Clan prided itself.

Procedure:

1) Conduct a discussion about legends in general. Brainstorm some of the extraordinary characteristics of loons which might be the subject of legends.

Suggested discussion:

- What is a legend?
- Do you know any legends?
- Why do people make up legends?
- Do you think that making up legends about wild creatures made them feel closer and friendlier to the animals?
- What are some characteristics that make loons special?

2) Next, read *How the Loon Got Its Necklace*, a legend that Native Americans made up about loons.

HOW THE LOON GOT ITS NECKLACE

Once upon a time there was an old man who became blind. He felt badly because he could no longer see to catch fish or hunt for his family. The old man went down to the edge of the water and cried out his grief. A loon swam up to him and called to him asking, "Why are you crying, Old Man?" The old man said, "loon, you are a wise bird and a wonderful fisherman; with your red eye you see to great depths to catch fish for yourself and your family. I can no longer see to catch fish, so my family is hungry; that is why I am crying."

The loon called back to the old man, "Come and hold tight to my wings and bury your eyes in my feathers and I will take you through the pure waters to very deepest part and then you will be able to see again." So the old man grabbed the loon's wings very tightly, buried his sightless eyes in the loon's feathers and the loon dove into the water. Down, down, down they went until the old man thought his lungs would burst. When they came back up the man could see light, and could just make out the trees on the shoreline. They dove again deep into the water and old man thought his lungs would really burst this time because they stayed under water so long. But when they came back to the surface the old man could see.

He was overjoyed. He said to the loon (whose feathers were all black at that time), "Oh loon, I am so grateful to you that I am going to give you my most precious possession: this beautiful necklace made of white shells." The old man took off his necklace and tossed it around the loon's neck. Everywhere the shells touched, the loons black feathers turned to white marks. That is why the loon has a beautiful white necklace and a white pattern on its back.

3) Discuss the legend and its elements:

- Characters
- Setting
- Problem
- Event(s)
- Solution

Ask questions such as:

- How does the legend grab your attention?
- What does it try to make you feel, believe, or understand?
- Does the storyteller attempt to explain the unknown?
- Does it bother the students that legends are not true?
- If the stories are not true, what purpose do they serve?

4) Have students create their own legends about loons.

Divide the class into two or three groups and let each make up a legend about how the loon obtained one of its special characteristics such as: red eye, diving ability, eerie call; or why loon babies ride on their parents backs or fight each other.

Encourage students to begin by making a list of elements identified above in part 3. Ask them to place the elements in chronological order and to give concrete examples; e.g. strength can be exhibited at the beginning of the story when a loon dives beneath the water and emerges far from the site where it dove. Tell them also, that the last line of a legend almost always begins with: "That is why ....."

5) After students have finished creating their legends, have them share their legends with the rest of the class. You may even have them act out their legends.

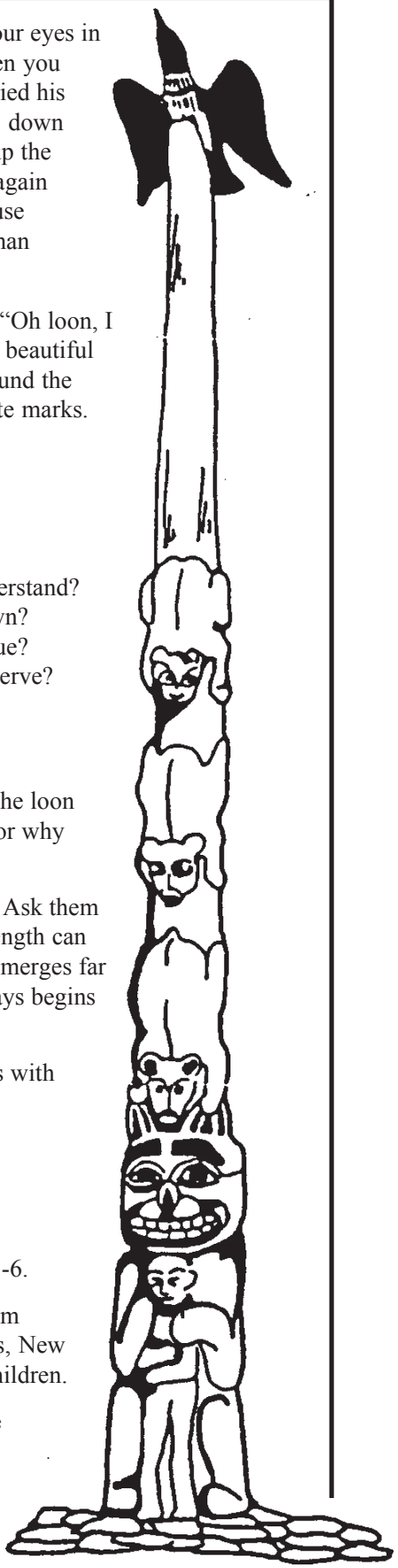
Extensions:

1. Read other myths about loons in *Love of Loons* by Kate Crowley and Mike Link, University of Minnesota Press, 1987. pp. 14-17 and *The Common Loon: Spirit of Northern Lakes* by Judith W. McIntyre, University of Minnesota Press, 1988. pp. 1-6.

2. Have students illustrate their legends and display them in the classroom or put them together in a class book. See *Loon's Necklace* by W. Toye, Oxford University Press, New York, 1977. Illustrated version of the legend of how the loon got its necklace for children.

3. Show students the video "The Loon's Necklace" available for check out from the Project WILD office.

4. Do the activity "Mermaid and Manatees," in the Project WILD Aquatic guide in which students describe how imaginary creatures may be inspired by actual animals and give examples of how wildlife can inspire myth and art.



Issues/Action

Things Spelling "Trouble" for Loons & Grebes

Loons and grebes are among the oldest groups of birds still living today, with histories stretching back more than 50 million years. Through those millions of years, they have endured various natural problems such as predation, diseases and parasites, climate changes and primitive hunters. The modern world of the last 150 years however, has created many new and especially severe challenges for these birds.

The following is a summary of threats to loons and grebes. **Note that much of what has been learned and is being shared here with you about these threats is discussed specifically in reference to loons. Similar threats, however, pose serious problems to grebes as well.**

Destruction of Breeding Habitat: Historical data show that loons have abandoned some of their former nesting areas over time. Loss of breeding habitat and disturbance are thought to be the main causes of this reduction in their original breeding range. Development of shorelines and islands for campsites, marinas and ribbons of summer homes has preempted optimal nest sites, forcing loons to use marginal nesting areas lacking protective cover, making them more susceptible to predation and inclement weather. Increased populations of egg and chick predators including raccoons, crows and gulls, which scavenge upon the abundance of human refuse associated with development, have resulted in excessive mortality as well. And dams and spillways built for flood control and hydroelectric power have also degraded habitat by creating unstable water levels that either swamp loon nests or leave them stranded high on shorelines beyond reach.

Recreational Use of Lakes: Waves generated by high speed motor boats have caused nests to be washed out or sunk. Boats and especially jet skies which are fast, highly maneuverable and able to run in shallow water can separate chicks from their parents or even cause injury and death. Slow moving watercraft that approach nesting loons too closely can also cause loons to flush from their nests exposing eggs to predators and the elements.

Shooting and Trapping: Protected by law, loons are occasionally shot on purpose. Some anglers hold grudges against loons and attempt to kill them, claiming unwarrantedly, that loons eat all the fish out of lakes. Loons are also still legally hunted by native people in parts of Canada.

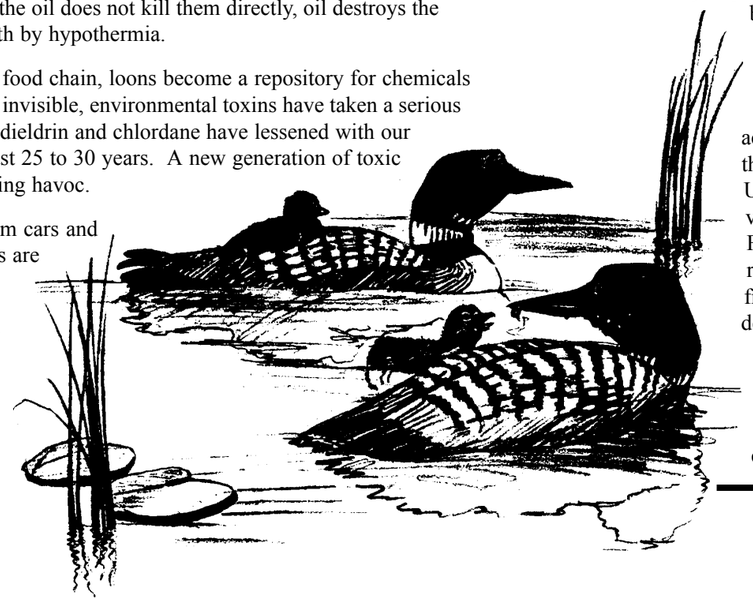
Fishing Nets, Line and Hooks: In both fresh and marine waters, loons have drowned in commercial underwater traps and gill nets. Some nets with escape hatches are slowly beginning to be utilized to minimize entrapment. Loons sometimes accidentally ingest hooks leading to infections and other internal damage. They also become entangled in monofilament rendering them unable to feed or unable to effectively preen their feathers to stay dry and warm.

Oil Spills: Oil spills are an extra threat to loons because they dive rather than fly to escape oil slicks. In attempts to clean their feathers, they usually swallow deadly amounts of oil. If the oil does not kill them directly, oil destroys the natural water proofing property of their feathers which leads to death by hypothermia.

Environmental Toxins: Because of their position atop the aquatic food chain, loons become a repository for chemicals people spew into the environment. More insidious because they are invisible, environmental toxins have taken a serious toll on loons. Impacts due to organochlorines such as DDT, PCBs, dieldrin and chlordane have lessened with our increased knowledge and regulation of these substances over the past 25 to 30 years. A new generation of toxic chemical offenders—acid rain, lead and mercury—are today wreaking havoc.

Acid Rain - In freshwater habitats, acid rain caused by exhaust from cars and power plants, destroys the food supply of loons since acidified lakes are unable to support many types of fish, crayfish and aquatic insects.

Lead - Having no teeth, loons ingest small pebbles from the bottom of the lake to help grind up food in their gizzards. Lead fishing sinkers and jigs are sometimes inadvertently swallowed along with the pebbles. Ingested lead is absorbed into the blood and tissues of loons where it causes severe kidney and other tissue damage. Lead poisoning is debilitating, slow and painful. A bird with lead poisoning will display physical and behavioral changes, including loss of balance, gasping, tremors and impaired ability to fly. It becomes emaciated and often dies within two to three weeks after ingesting the lead. Just one lead sinker can kill a loon. About 20 percent of all loon deaths in the United States are blamed on lead fishing tackle. Many other water birds are killed by lead as well. There are substitutes for lead and more than a dozen U.S. manufacturers produce lead-free sinkers and jigs. A nationwide ban on the use of lead fishing gear has not yet been instituted.



Mercury - Mercury, most commonly known as a shimmering, silver white metal is one of the most poisonous substances on Earth. There are many sources of mercury in the environment, both natural and man-made. People have been using a variety of forms of mercury for thousands of years since primitive artists first used rocks of cinnibar containing mercuric compounds to create paintings on the walls of their caves. People from around the world have used mercury to separate gold from dirt, measure barometric pressure and take body temperature. It has also had widespread use in mining, the smelting of metals, paper-making and the treatment of seeds for storage.

The toxic effects of this heavy metal on humans have been known for centuries. The phrase, "mad as a hatter" originated during the 1800s in England where mercury salts were commonly used in the process of making felt hats. Hat makers often developed the shakes and other symptoms of brain damage after being exposed to high levels of mercury. It is known that lower levels can cause serious neurological and developmental problems in children, and birth defects when pregnant women are exposed.

Nature contributes mercury into the environment via volcanic eruptions and outgassing from the earth's crust. This natural amount is small though compared to the amount generated by humans. Mercury cycles through the environment in various chemical forms in air, land and water. In the atmosphere, mercury can stay airborn for a year or two. Eventually it attaches to raindrops that fall from the sky. When deposited in water, the mercury is chemically transformed by bacteria into methyl mercury, an especially toxic form of mercury that is readily absorbed by phytoplankton and zooplankton, and quickly moves up the aquatic food chain. On its way up the food chain, mercury concentrations rise in each predator through a process known as biomagnification. As a result the topmost predators accumulate concentrations of mercury many times greater than the original amount in surrounding waters. Because of its toxicity, 41 states to date have posted fish consumption advisories on waters where high levels of mercury have been detected in fish. High levels of mercury can last in fish for 20 or more years after the mercury source is removed. It is estimated that just one drop of mercury in a 25-acre lake can make the fish unsafe to eat. Acidic conditions in bodies of water apparently also enhance the conversion of mercury to methyl mercury.

The impacts of mercury on wildlife populations are not completely understood at this time. Many studies, including some on loons, are underway to find answers. Early data for loons seem to indicate that high mercury levels in the brains of loons may impact various breeding behaviors, affecting their overall breeding success. Mercury may also cause neurological effects such as a slowing of reflexes in individuals and may shorten the life expectancy of loons.

Conservation and Management: Galvanized into action by awareness of the many threats to loons, in the 1970s, activists across Canada and the northeastern United States began to form a number of loon conservation organizations such as the North American Loon Fund. Numerous volunteers coined "Loon Rangers," rode into action, safeguarding nursery areas and nests from disturbance, providing intensive public education, developing and introducing artificial nesting platforms, working to protect habitats, stabilizing water levels and more. Such volunteers and the organizations to which they belong have been instrumental in garnering funds to support research and host international conferences on loon threats and loon conservation.

What You Can do to Help:

- Join a bird or wildlife conservation organization such as the Audubon Society or National Wildlife Federation.
- Educate others about the problems threatening loons and grebes.
- Support national legislation prohibiting the use of lead fishing tackle.
- Don't litter and retrieve all fishing line, hooks and sinkers you use or find.
- Participate in land-use planning meetings to control shoreline developments along lakes where loons and grebes nest.
- Avoid boating and jetskiing on waters with nesting birds.
- Support legislation to protect wetlands, control acid rain producing pollution and regulate the use of chemicals.
- Don't put mercury or mercury-containing products in the trash or down the drain.
- Conserve energy in order to reduce the mercury released from coal-fired power plants.
- Buy non-mercury containing thermometers and replace mercury thermostats with digital ones.
- Properly dispose of flourescent and mercury vapor lamps at a hazardous waste or recycling facility.
- Recycle used oil.

project WILD

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